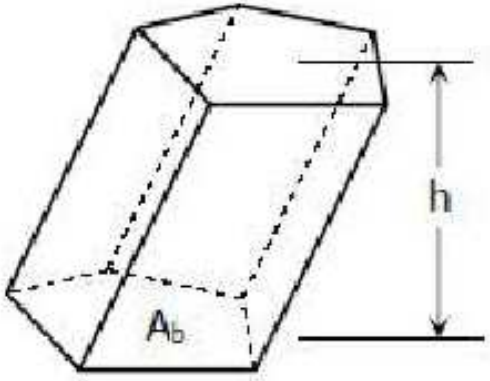
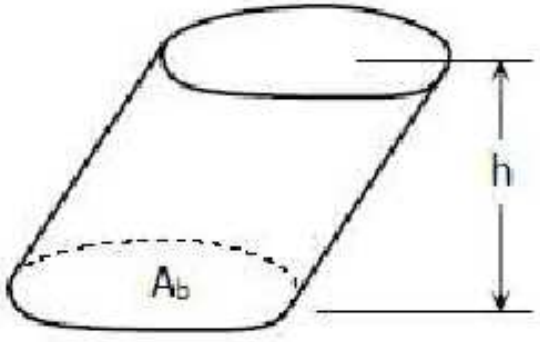
SOLID MENSURATION

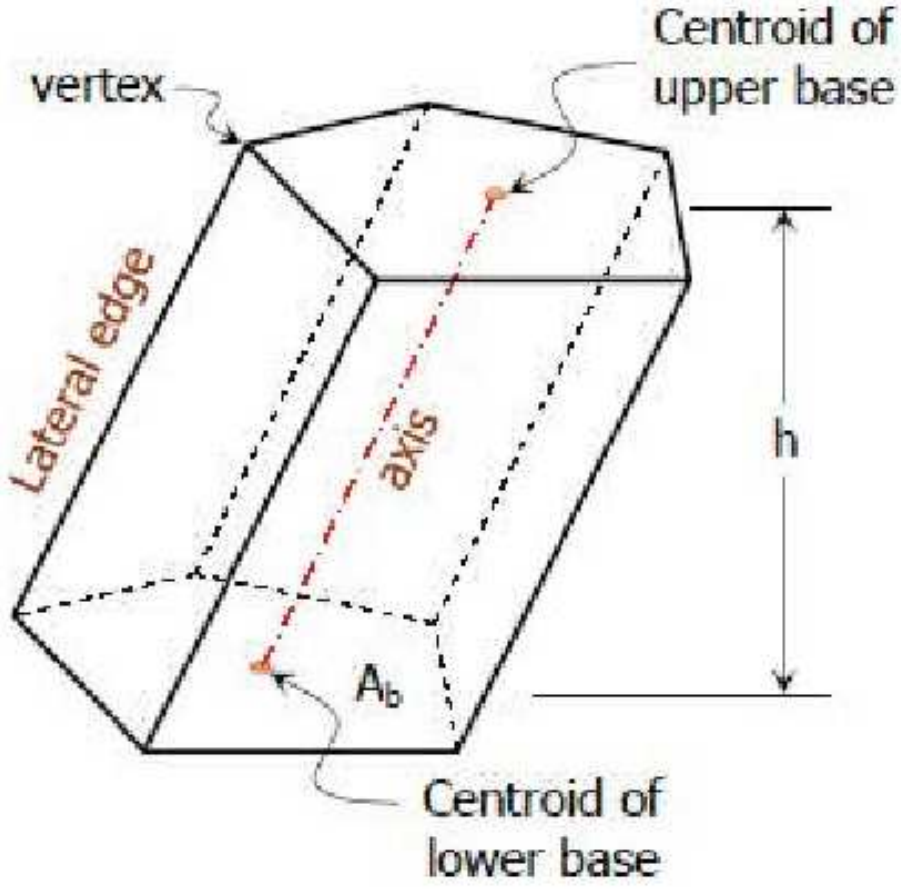
Solids for which V=Bh



Prism

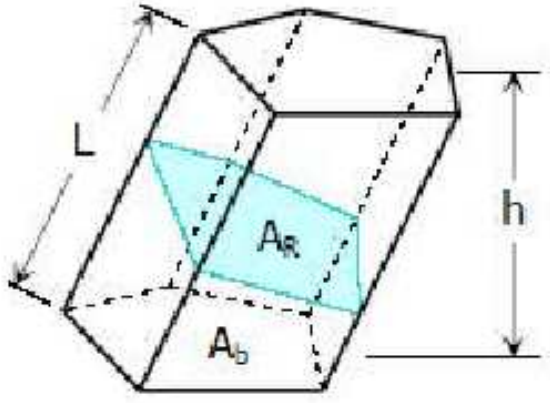


Cylinder

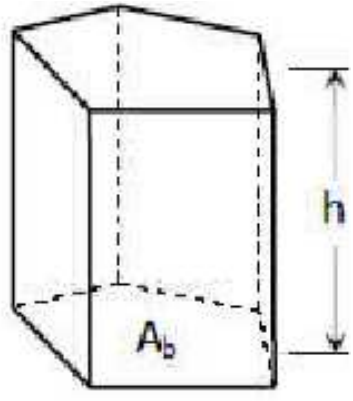


PRISMS

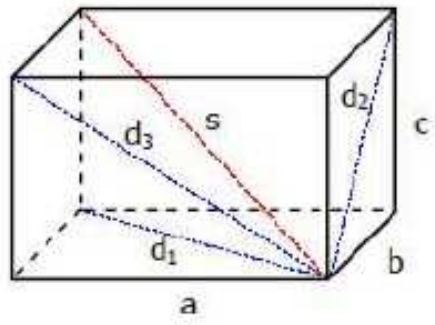
- Where
  V = volume of the prism
  A_R = area of the right section
  L = length of the lateral side
  A_b = area of the base
  h = altitude
  A_L = area of the lateral side
  P_R = perimeter of the right section
  Note that for right prism, $A_R = A_b$ and L



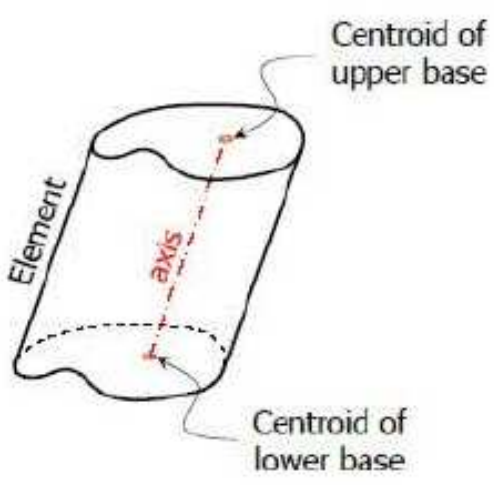
Oblique Prism



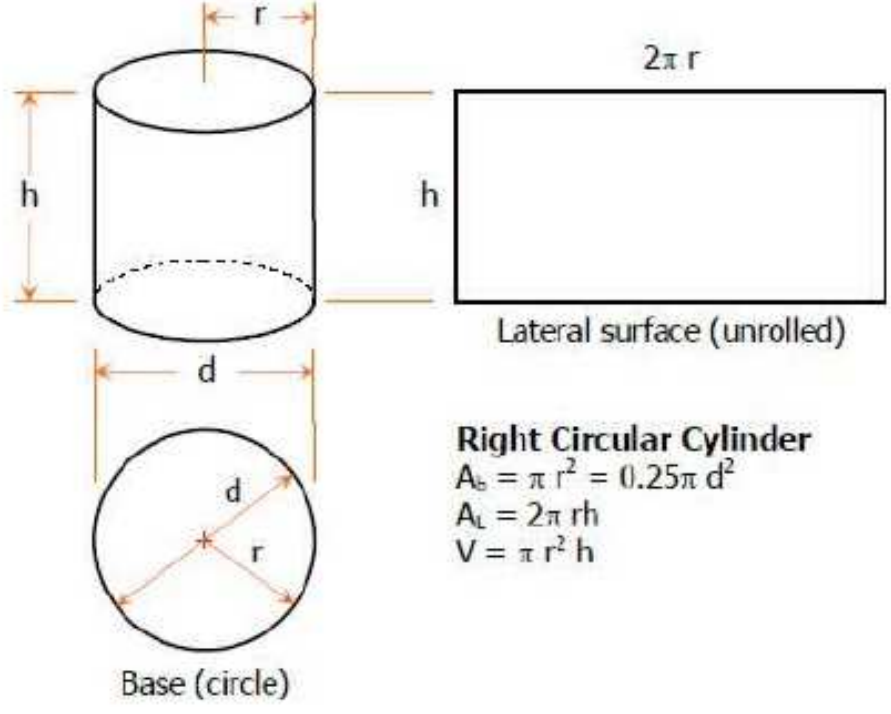
Right Prism



Rectangular Parallelepiped (Cuboid)



Cylinder



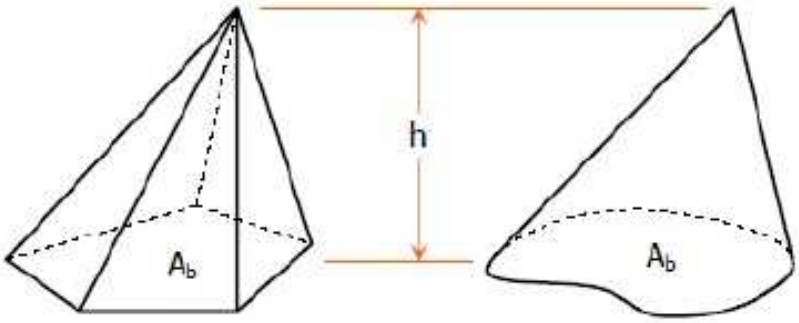
Right Circular Cylinder

$A_b = \pi r^2 = 0.25\pi d^2$

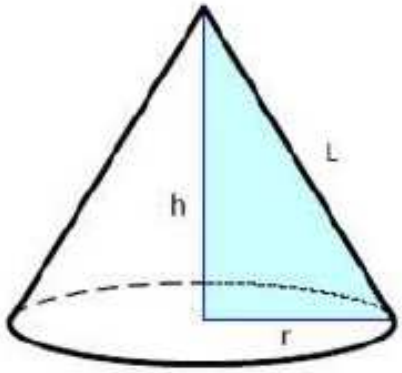
$A_L = 2\pi rh$

$V = \pi r^2 h$

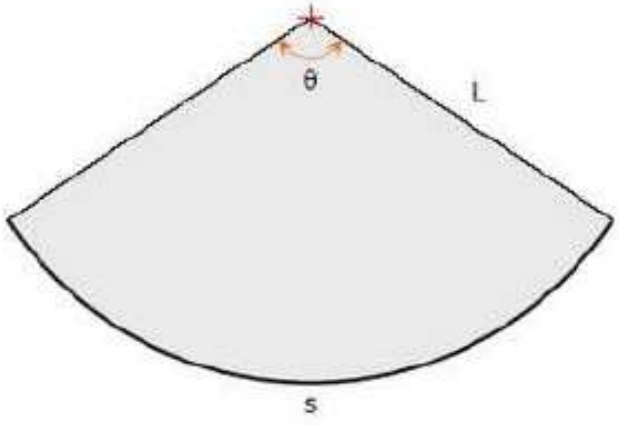
Solids for which V=(1/3)Bh



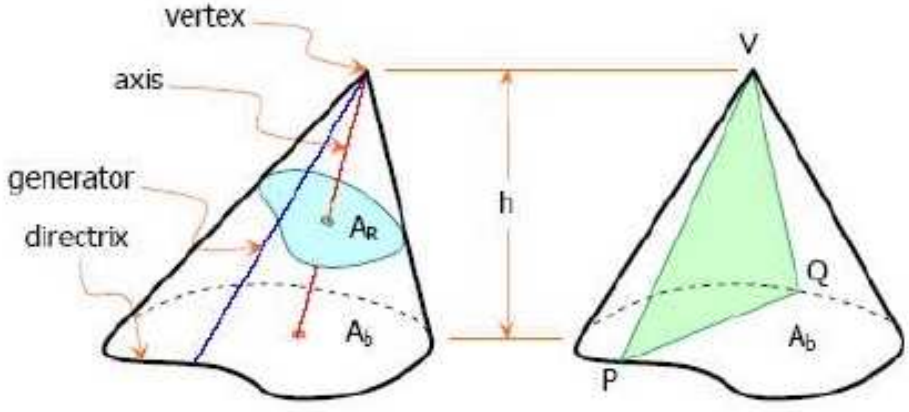
Pyramid Cone



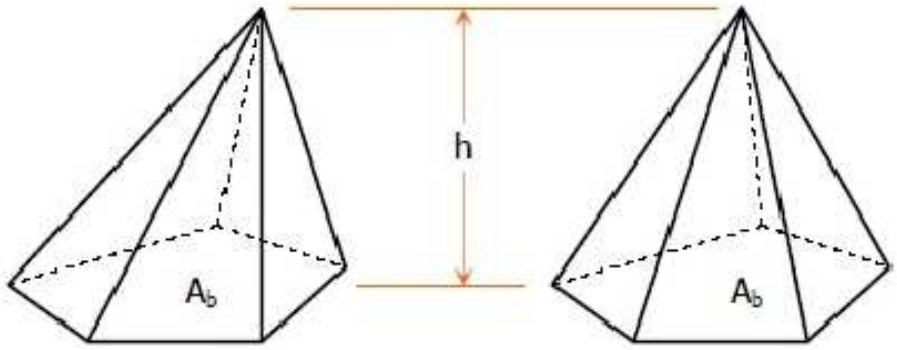
Right Circular Cone



Unrolled Lateral Area

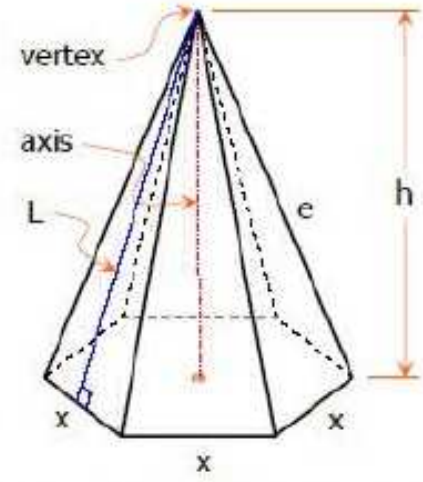


Oblique Cone Right Cone

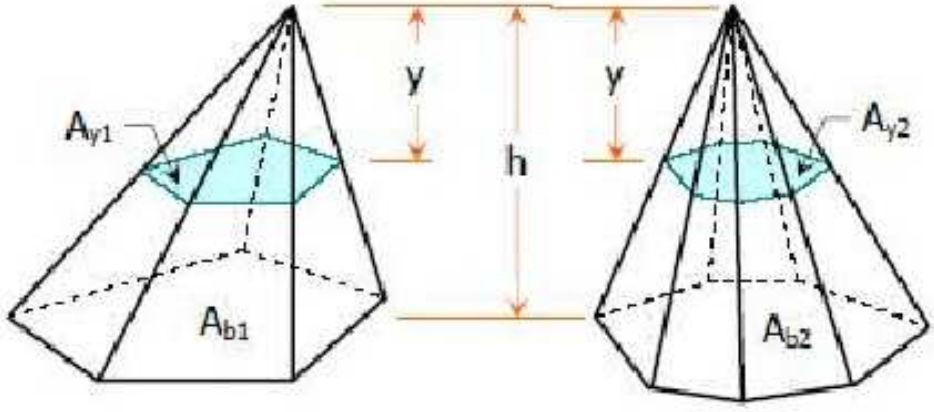


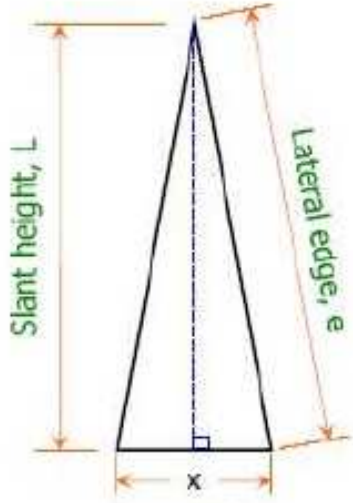
Oblique Pyramid

Right Pyramid



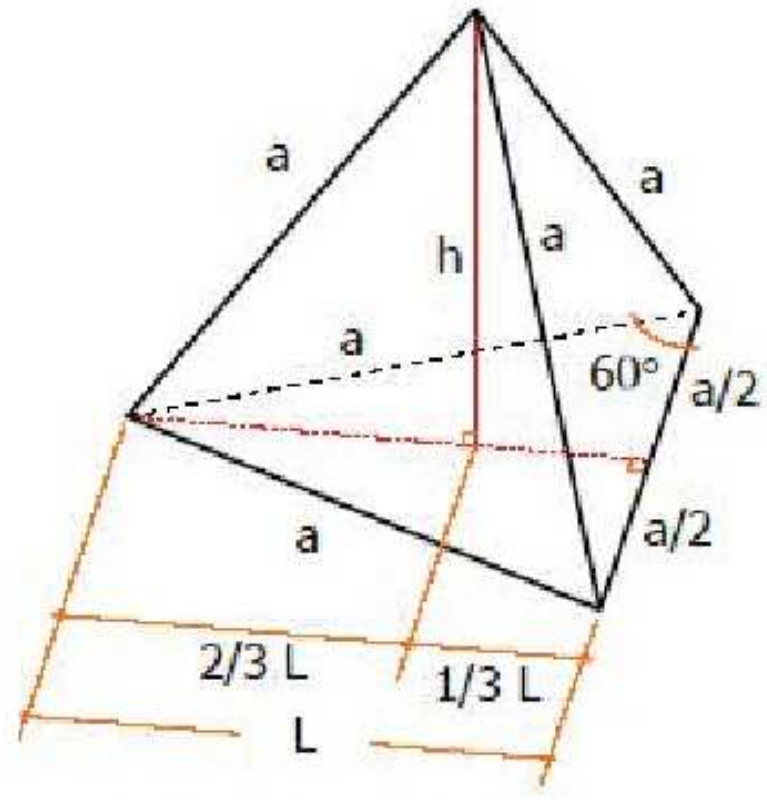
Regular Pyramid (hexagonal)



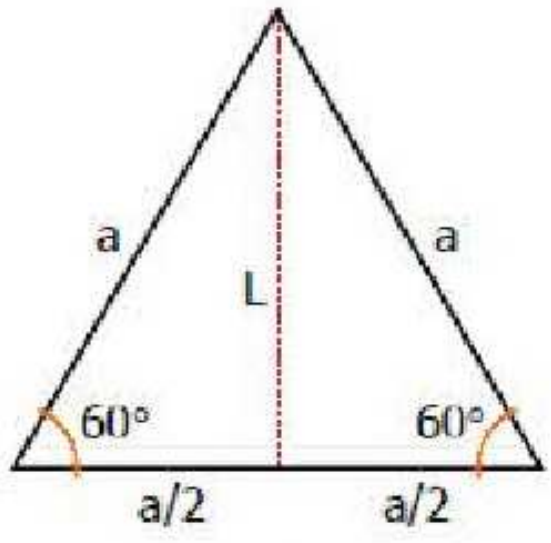


Lateral face

Regular Tetrahedron

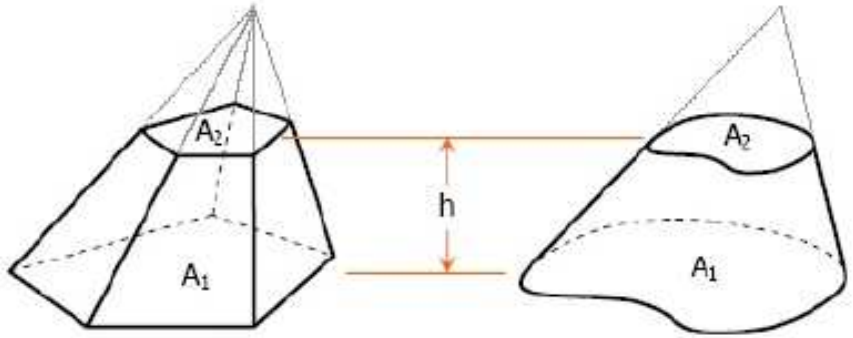


Regular Tetrahedron



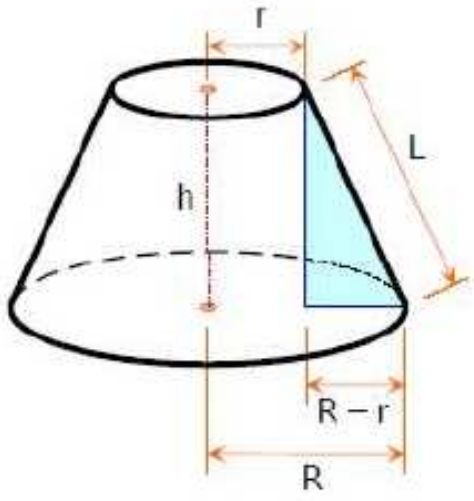
One Face of
Regular Tetrahedron

FRUSTRUM

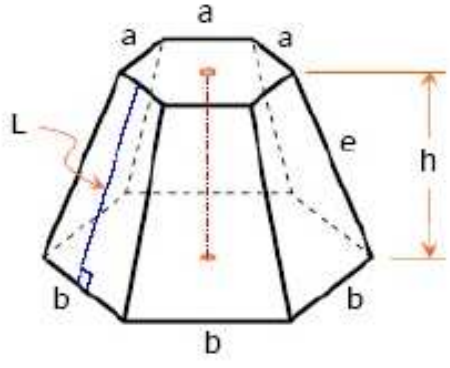


Frustum of a Pyramid

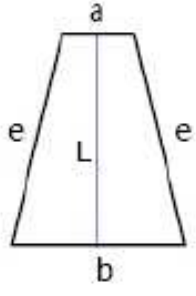
Frustum of a Cone



Frustum of a Right Circular Cone



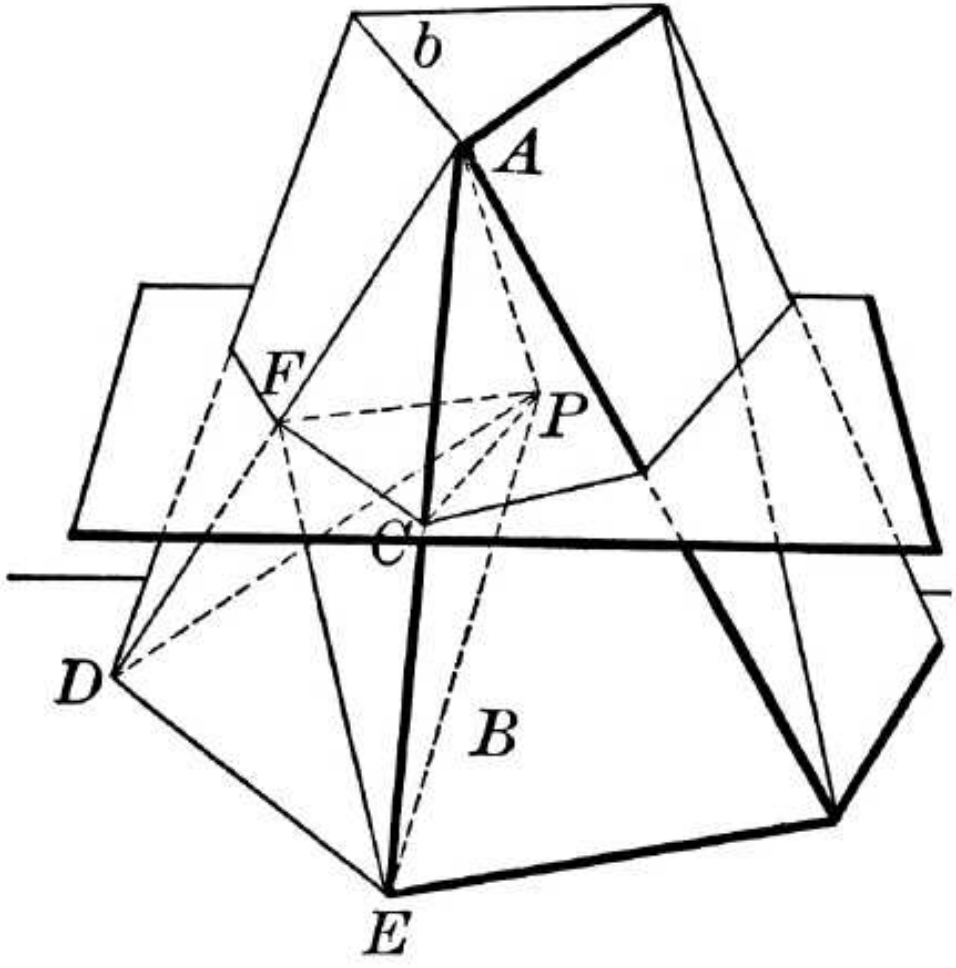
Frustum of
Regular Pyramid



Lateral Face of Frustum
of Regular Pyramid

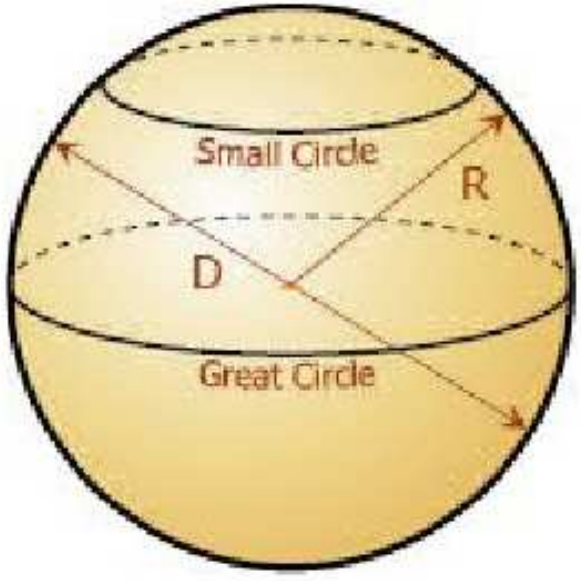
$$V = \frac{(B + b + \sqrt{Bb})}{3} h$$

PRISMATOID



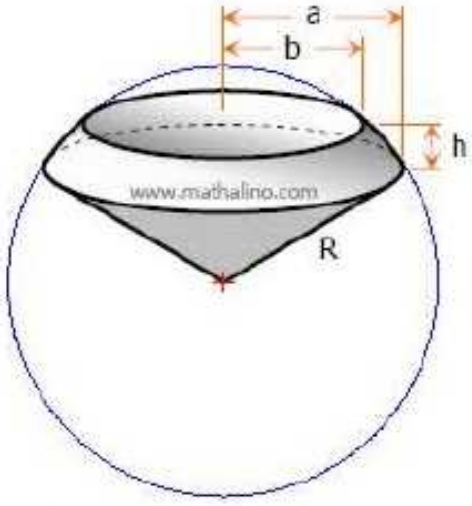
$$V = \frac{\left(B + b + 4M\right)}{6} h$$

Sphere



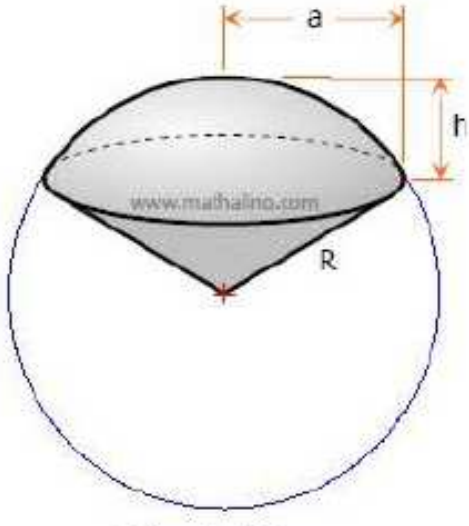
$$V = \frac{4\pi R^3}{3} = \frac{\pi D^3}{24}$$

$$S = 4\pi R^2 = \pi D^2$$

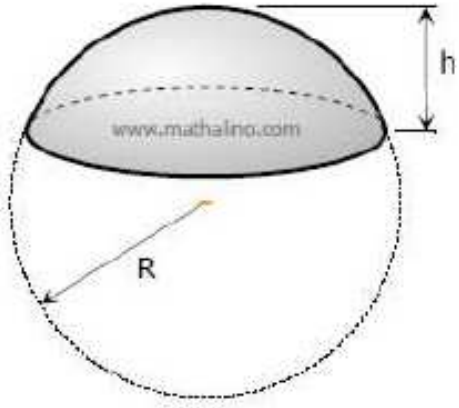


Open Spherical Sector

$$V = \frac{ZR}{3}$$

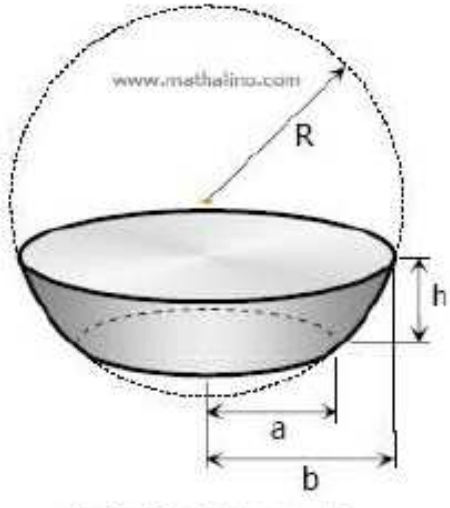


Spherical Cone



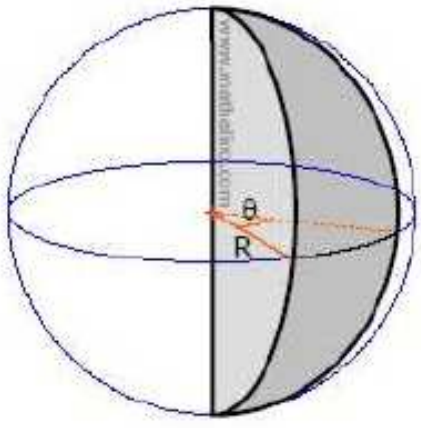
Spherical Segment
Of One Base

$$V = \frac{\pi h^2 (3R - h)}{3}$$

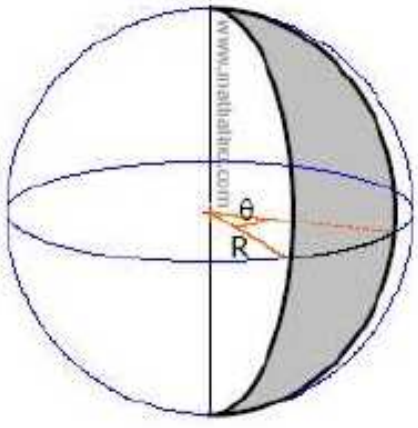


Spherical Segment
Of Two Bases

$$V = \frac{\pi h\left(3a^2 + 3b^2 + h^2\right)}{6}$$

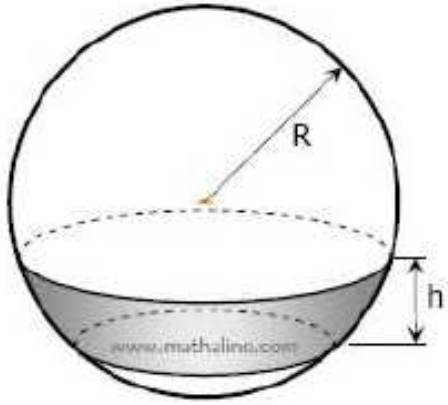


Spherical Wedge

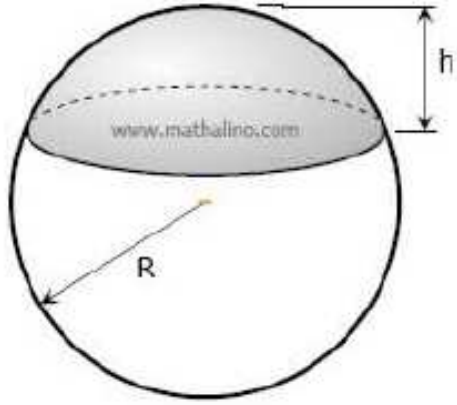


Spherical Lune

$$Z = 2\pi Rh$$



Spherical Zone
Of Two Bases



Spherical Zone
Of One Base

- Each side of a tetradecagon is “e”. What is its area?
  a. 28.46 e^2 sq. units
  b. 16.33 e^2 sq. units
  c. 15.33 e^2 sq. units
  d. 46.35 e^2 sq. units
  e. none of these

- A corner lot of land is 35 m on one side street and 25 m on the other street. The angle between the two lines of the street being 82°. The other two lines of the lot are respectively perpendicular to the lines of the streets. What is the worth of the lot if its unit price is Php 2,500 per square meter?
  a. Php 1.978 M
  b. Php 2.234 M
  c. Php 1.588 M
  d. Php 1.884 M
  e. none of these

- A cylindrical gasoline tank, lying horizontally, 0.90 meters in diameter and 3 meters long is filled to a depth of 0.6 meters. How many gallons of gasoline does it contain?
  a. 250.20 gallons
  b. 300.00 gallons
  c. 358.18 gallons
  d. 273.45 gallons
  e. none of these

- Two vertical square pyramidal tanks (both inverted) have their vertices connected by a short horizontal pipe. One tank initially full of water has an altitude of 10 feet and a base edge of 3 feet. The other tank initially empty has an altitude of 11 feet and a base edge of 5 feet. If water is allowed to flow through the connecting pipe find the level to which the water will ultimately rise in the empty tank. (neglect the water in the pipe)
  a. 6.72 feet
  b. 16.80 feet
  c. 7.72 feet
  d. 17.42 feet
  e. none of these

- A tin cup is in the shape of a frustum of a cone. The internal diameters of the cup at the top and the bottom are respectively 3 inches and 4 inches, and the internal depth is 6 inches. Suppose that a conical piece is added into the cup so as to complete the cone. Find the volume of the complete cone.
  a. 32π cu. inches
  b. 31π cu. Inches
  c. 33π cu. inches
  d. 30π cu. inches
  e. none of these

- It is desired to cut off a piece of lead pipe 2 inches in outside diameter and 1/4 inches thick, so that it will melt into a cone of diameter 11.0558 inches and an altitude of 2 inches. How long would that piece of lead pipe be?
  a. 3.88 feet
  b. 46.56 feet
  c. 2.88 feet
  d. 20.65 feet
  e. none of these

- Find the upper base edge of the frustum of a regular pentagonal pyramid if its volume is 1505.4171 cubic meters, the lower base edge is 10 and the altitude is 15 meters.
  a. 5 meters
  b. 6 meters
  c. 7 meters
  d. 4 meters
  e. none of these

- A gallon of water is poured into a spherical bowl of radius 5.72 inches. Find the diameter of the surface of the water.
  a. 10.243 inches
  b. 10.432 inches
  c. 12.431 inches
  d. 11.234 inches
  e. none of these

- A hemispherical tank contains liquids A and B with a total depth of 12 cm. with liquid B on top of liquid A. Liquid A has a depth of 8 cm. If the volume of liquids A and B are equal. Compute the Radius of the tank.
  a. 14.67 cm
  b. 3.56 cm
  c. 12.54 cm
  d. 28.74 cm
  e. none of these

- To what height must a man be raised above the earth in order to see one-fourth of its surface?
  a. ht. = radius of the earth
  b. ht. = diameter of the earth
  c. ht. = half of the earth’s radius
  d. ht. = twice the radius
  e. none of these

- Find the area of the earth’s surface within the Arctic Circle; that is, in latitude north of 66°32’ N, the approximate radius of the earth is 3960 miles.
  a. 8,150,000 miles
  b. 8,342,000 miles
  c. 8,653,000 miles
  d. 8,435,000 miles
  e. none of these

- A solid consist of a hemisphere surmounted by a cone. Find the vertical angle of the cone if the volumes of the conical and spherical potions are equal.
  a. 53°08’
  b. 63°26’
  c. 26°34’
  d. 31°43’
  e. none of these

Solve for the Volume of the Prismatoid